



Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
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Canada

Tel (613) 632-5200

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**D350-748-141TRN**  
**Job Sheet 174688**



Part No: D350-748-141TRN

Job Qty: 1 ea

Part Name: Crosstube Turning Detail



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 3/20/18

Job Tracking No:

Due Date: 6/1/18

Created By: Marie Lajeunesse

Type: SOLD

Description:

Note: D350-748-141 REV H IPP Rev:A New Issue 08-03-06 DD verified by:ec IPP Rev B Removed polish 08.04.02  
EC verified by : DD IPP Rev C Remove LPS-3 08.06.23 EC verified by DD IPP Rev C 11.02.24 as per dwg  
rev.F DD verf: JLM

Ship Via:

### Bill of Materials

### Job Routing

| Op No | Operation          | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off       |
|-------|--------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|----------------|
|       |                    |       |            |          | Setup hrs | Run Hrs | Workcenter / Supplier | Lead Time |                |
| 90    | Start up Operation | 1 Ea  |            | 5/31/18  | 0.00      | 0.00    | Start Up Crosstubes-1 |           | M.D.           |
| 100   | Mori Seiki         | 1 pcs |            | 5/31/18  | 7.06      | 2.81    | Mori Seiki TL-40      |           | M.D.           |
| 110   | QC                 | 1 pcs |            | 5/31/18  | 0.00      | 0.00    | QC2-1                 |           | M.D.           |
| 120   | Mori Seiki         | 1 pcs |            | 5/31/18  | 0.00      | 2.81    | Mori Seiki TL-40      |           | M.D.           |
| 130   | QC                 | 1 pcs |            | 5/31/18  | 0.00      | 0.00    | QC2-1                 |           | M.D.           |
| 140   | QC                 | 1 pcs |            | 5/31/18  | 0.00      | 0.00    | QC8                   |           | M.D.           |
| 150   | Crosstubes         | 1 pcs |            | 6/1/18   | 0.00      | 0.97    | Crosstubes-2          |           | GP 18-05-30    |
| 160   | QC                 | 1 pcs |            | 6/1/18   | 0.00      | 0.00    | QC15 N/R              |           |                |
| 170   | Outsource          | 1 pcs |            | 6/1/18   | 0.00      | 0.00    | Outsource1            |           | CT 18-6-5      |
| 180   | Packaging          | 1 pcs |            | 6/1/18   | 0.00      | 0.00    | Packaging2            |           | AT 18-7-11     |
| 185   | QC                 | 1 pcs |            | 6/1/18   | 0.00      | 0.00    | QC6                   |           | 13-07-18       |
| 190   | Packaging          | 1 pcs |            | 6/1/18   | 0.00      | 0.00    | Packaging3-1          |           | 10-13-07-18    |
| 200   | QC21-SA            | 1 Ea  |            | 6/1/18   | 0.00      | 0.00    | QC21                  |           | 21 JUL 20 2018 |

Part Op 100 - 1-Fill tube with sand & install plugs on both ends as per Folio FA648 2-Turn first side as per Folio FA648 3- File  
Descriptions: transition lines smooth. FOLIO REV: H DWG REV: H  
120 - 1-Turn second side as per Folio FA648 2- File transition lines smooth. 3-Scribe Part & Batch as per Dwg D350-748-  
141 FOLIO REV: \_\_\_\_\_ DWG REV: \_\_\_\_\_  
130 - PERFORME ULTRASONIC MEASURMENT  
150 - 1-DRILL HOLES FOR HEAT TREAT USING DT9806(HOLES MUST BE ALIGNED ON SAME LINE ON BOTH  
CUFFS) 2-Grind machining marks  
170 - Issue P/O: 040105 Heat Treat to min 180 KSI As per Dwg D350-748-141 (MIL-T-6736 OR AMS 2759-  
1C) \*\*\*Check for straighten and ensure parts are straight within 1/8" as per dwg \*\*\* Sand Blast tube after Heat Treat  
Possible Supplier: Vac Aero Ensure Certificate of Conformity is attached and Metlab process spec form  
190 - Identify and stock in kanban rack

### Job BOM

| Part / Item | Component Name     | Quantity    | Operation             | Container |
|-------------|--------------------|-------------|-----------------------|-----------|
| D6015-125   | Crosstube Material | 1 Ea (1 ea) | 90-Start up Operation |           |

B128 725

### Job Allocations

| Operation             | Component Part | Required | Inventory | Allocated |
|-----------------------|----------------|----------|-----------|-----------|
| 90-Start up Operation | D6015-125      | 1        | 0         | 0         |



DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                        | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                      | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Skid-tube <input type="checkbox"/></td> <td style="width: 15%;">Cross tube <input type="checkbox"/></td> <td style="width: 15%;">Water Jet <input type="checkbox"/></td> <td style="width: 15%;">Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table> |  |  |                       |                                              |  | Skid-tube <input type="checkbox"/>                                                                                                                                                                              | Cross tube <input type="checkbox"/>                                                                                                                                                                                                    | Water Jet <input type="checkbox"/>                                                                                                                                | Engineering <input type="checkbox"/>   | Machining <input type="checkbox"/>     | Small Fab <input type="checkbox"/>          | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> | Thermoforming <input type="checkbox"/>        | Finishing <input type="checkbox"/>     | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/>          | Large Fab <input type="checkbox"/>                       | Composite <input type="checkbox"/>          | Supplier <input type="checkbox"/>          |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| Skid-tube <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Cross tube <input type="checkbox"/>                                                                                                                                                                                                    | Water Jet <input type="checkbox"/>                                                                                                                                                 | Engineering <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| Machining <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Small Fab <input type="checkbox"/>                                                                                                                                                                                                     | Prod. Eng. Coord. <input type="checkbox"/>                                                                                                                                         | Quality <input type="checkbox"/>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| Thermoforming <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Finishing <input type="checkbox"/>                                                                                                                                                                                                     | Rec/Store/Packaging <input type="checkbox"/>                                                                                                                                       | Other <input type="checkbox"/>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| Large Fab <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Composite <input type="checkbox"/>                                                                                                                                                                                                     | Supplier <input type="checkbox"/>                                                                                                                                                  |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
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| <b>FAULT CATEGORY</b><br><table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Inspection Incomplete/Unqualified</td> <td style="width: 33%;"><input type="checkbox"/> Power Loss/Surge</td> <td style="width: 33%;"><input type="checkbox"/> Positioned Wrong</td> </tr> <tr> <td><input type="checkbox"/> Contamination</td> <td><input type="checkbox"/> Folio/Program</td> <td><input type="checkbox"/> Outside Dimensions</td> </tr> <tr> <td><input type="checkbox"/> Countersink</td> <td><input type="checkbox"/> Grain</td> <td><input type="checkbox"/> Over/Under tolerance</td> </tr> <tr> <td><input type="checkbox"/> Cut Too Short</td> <td><input type="checkbox"/> Weld</td> <td><input type="checkbox"/> Part Incorrect</td> </tr> <tr> <td><input type="checkbox"/> Instructions Incomplete/Unclear</td> <td><input type="checkbox"/> Wrong Stock Pulled</td> <td><input type="checkbox"/> Part Lost/Missing</td> </tr> <tr> <td><input type="checkbox"/> Drill Holes</td> <td><input type="checkbox"/> Out of Sequence</td> <td><input type="checkbox"/> Part Moved</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Off-set</td> <td><input type="checkbox"/> Drawing</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Misabeled</td> <td><input type="checkbox"/> Finish</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Fit/Function</td> <td><input type="checkbox"/> Misread</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Misaligned/off center</td> <td><input type="checkbox"/> Turning Sequence</td> </tr> </table> |                                                                                                                                                                                                                                        |                                                                                                                                                                                    |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  | <input type="checkbox"/> Inspection Incomplete/Unqualified                                                                                                                                                      | <input type="checkbox"/> Power Loss/Surge                                                                                                                                                                                              | <input type="checkbox"/> Positioned Wrong                                                                                                                         | <input type="checkbox"/> Contamination | <input type="checkbox"/> Folio/Program | <input type="checkbox"/> Outside Dimensions | <input type="checkbox"/> Countersink       | <input type="checkbox"/> Grain   | <input type="checkbox"/> Over/Under tolerance | <input type="checkbox"/> Cut Too Short | <input type="checkbox"/> Weld                | <input type="checkbox"/> Part Incorrect | <input type="checkbox"/> Instructions Incomplete/Unclear | <input type="checkbox"/> Wrong Stock Pulled | <input type="checkbox"/> Part Lost/Missing | <input type="checkbox"/> Drill Holes | <input type="checkbox"/> Out of Sequence | <input type="checkbox"/> Part Moved |  | <input type="checkbox"/> Off-set | <input type="checkbox"/> Drawing |  | <input type="checkbox"/> Misabeled | <input type="checkbox"/> Finish |  | <input type="checkbox"/> Fit/Function | <input type="checkbox"/> Misread |  | <input type="checkbox"/> Misaligned/off center | <input type="checkbox"/> Turning Sequence |
| <input type="checkbox"/> Inspection Incomplete/Unqualified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> Power Loss/Surge                                                                                                                                                                                              | <input type="checkbox"/> Positioned Wrong                                                                                                                                          |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <input type="checkbox"/> Contamination                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input type="checkbox"/> Folio/Program                                                                                                                                                                                                 | <input type="checkbox"/> Outside Dimensions                                                                                                                                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <input type="checkbox"/> Countersink                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> Grain                                                                                                                                                                                                         | <input type="checkbox"/> Over/Under tolerance                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <input type="checkbox"/> Cut Too Short                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input type="checkbox"/> Weld                                                                                                                                                                                                          | <input type="checkbox"/> Part Incorrect                                                                                                                                            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <input type="checkbox"/> Instructions Incomplete/Unclear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <input type="checkbox"/> Wrong Stock Pulled                                                                                                                                                                                            | <input type="checkbox"/> Part Lost/Missing                                                                                                                                         |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <input type="checkbox"/> Drill Holes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> Out of Sequence                                                                                                                                                                                               | <input type="checkbox"/> Part Moved                                                                                                                                                |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Fit/Function                                                                                                                                                                                                  | <input type="checkbox"/> Misread                                                                                                                                                   |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Misaligned/off center                                                                                                                                                                                         | <input type="checkbox"/> Turning Sequence                                                                                                                                          |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">           Inte<br/>           Tribal Knowledge <input type="checkbox"/><br/>           LOA <input type="checkbox"/><br/>           Substation <input type="checkbox"/><br/>           Past Expiry Date <input type="checkbox"/><br/>           Misidentified <input type="checkbox"/> </td> <td style="width: 25%;">           Information<br/>           Rushing <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Past Due <input type="checkbox"/> </td> <td style="width: 25%;">           Crushing <input type="checkbox"/><br/>           Heat Treat <input type="checkbox"/><br/>           Wave/Twist in Tube <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/> </td> <td style="width: 25%;">           OTHER : <input type="checkbox"/> </td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                        |                                                                                                                                                                                    |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  | Inte<br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | Information<br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/> | OTHER : <input type="checkbox"/>       |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |
| Inte<br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Information<br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/>                  | OTHER : <input type="checkbox"/>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |                       |                                              |  |                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |                                                                                                                                                                   |                                        |                                        |                                             |                                            |                                  |                                               |                                        |                                              |                                         |                                                          |                                             |                                            |                                      |                                          |                                     |  |                                  |                                  |  |                                    |                                 |  |                                       |                                  |  |                                                |                                           |

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 1270 Aberdeen Street  
 Hawkesbury, ON K6A 1K7  
 CANADA  
 TEL: 1-813-632-5200  
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 www.dartaerospace.com  
  
 Container No: S068942  
 Part: D350-748-141TRN  
 Job No: 174688  
 Serial No/Batch: S068942  
 Revision: H  
 Inspector:

Date: 05/07/18

## Part Specifications

Specifications could not be found.

Plex 3/20/18 3:02 PM Dart.lajeunesse.marie

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                            |  |                                              |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Step #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | MRB (QSI042) Approval                        |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Completed By                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Lead hand / Supervisor Approval Verification |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | QC / QA Coordinator Approval                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                              |  |
| <div style="display: flex;"> <div style="flex: 1;">           Environment <input type="checkbox"/><br/>           Design <input type="checkbox"/><br/>           Doc/Data <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Pre <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Internal Transport <input type="checkbox"/><br/>           Tribal Knowledge <input type="checkbox"/><br/>           LOA <input type="checkbox"/><br/>           Substation <input type="checkbox"/><br/>           Past Expiry Date <input type="checkbox"/><br/>           Misidentified <input type="checkbox"/> </div> <div style="flex: 1;">           No Re-verification <input type="checkbox"/><br/>           Operator <input type="checkbox"/><br/>           Offset/Setup <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Training <input type="checkbox"/><br/>           Use for Testing <input type="checkbox"/><br/>           Poor Information <input type="checkbox"/><br/>           Rushing <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Past Due <input type="checkbox"/> </div> </div> | <div style="display: flex;"> <div style="flex: 1;">           Pressure/Forced <input type="checkbox"/><br/>           Bending <input type="checkbox"/><br/>           Centre Not Concentric <input type="checkbox"/><br/>           Cracks <input type="checkbox"/><br/>           Crimp/Kink/Ripple/Wave <input type="checkbox"/><br/>           Cuffs <input type="checkbox"/><br/>           Crushing <input type="checkbox"/><br/>           Heat Treat <input type="checkbox"/><br/>           Wave/Twist in Tube <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/> </div> <div style="flex: 1;">           Temperature/Cure <input type="checkbox"/><br/>           Set-up <input type="checkbox"/><br/>           BOM/Route <input type="checkbox"/><br/>           Broken/Damage/Defect <input type="checkbox"/><br/>           Inspection Incomplete/Unqualified <input type="checkbox"/><br/>           Contamination <input type="checkbox"/><br/>           Countersink <input type="checkbox"/><br/>           Cut Too Short <input type="checkbox"/><br/>           Instructions Incomplete/Unclear <input type="checkbox"/><br/>           Drill Holes <input type="checkbox"/> </div> </div> | <div style="display: flex;"> <div style="flex: 1;">           Power Loss/Surge <input type="checkbox"/><br/>           Folio/Program <input type="checkbox"/><br/>           Grain <input type="checkbox"/><br/>           Weld <input type="checkbox"/><br/>           Wrong Stock Pulled <input type="checkbox"/><br/>           Out of Sequence <input type="checkbox"/><br/>           Off-set <input type="checkbox"/><br/>           Mislabeled <input type="checkbox"/><br/>           Fit/Function <input type="checkbox"/><br/>           Misaligned/off center <input type="checkbox"/> </div> <div style="flex: 1;">           Positioned Wrong <input type="checkbox"/><br/>           Outside Dimensions <input type="checkbox"/><br/>           Over/Under tolerance <input type="checkbox"/><br/>           Part Incorrect <input type="checkbox"/><br/>           Part Lost/Missing <input type="checkbox"/><br/>           Part Moved <input type="checkbox"/><br/>           Drawing <input type="checkbox"/><br/>           Finish <input type="checkbox"/><br/>           Misread <input type="checkbox"/><br/>           Turning Sequence <input type="checkbox"/> </div> </div> |  |                                              |  |
| OTHER : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                              |  |



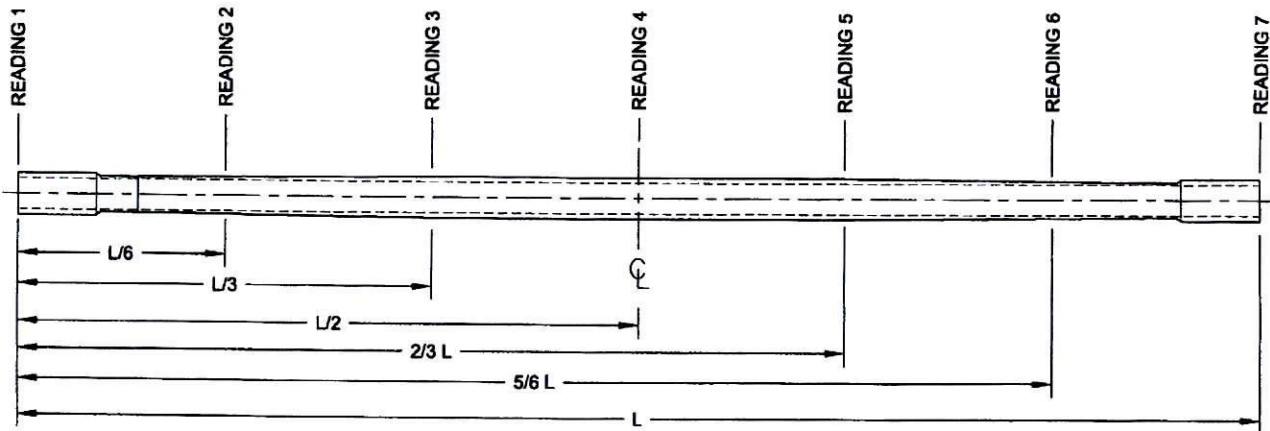
|                                                             |  |                                  |
|-------------------------------------------------------------|--|----------------------------------|
| <b>DART AEROSPACE LTD</b>                                   |  | <b>Work Order:</b> 174688        |
| <b>Description:</b> Crosstube Assembly (AS350/355 High Fwd) |  | <b>Part Number:</b> D350-748-141 |
| <b>Inspection Dwg:</b> D350-748-141 <b>Rev:</b> H           |  | <b>Page 1 of 2</b>               |

### FIRST ARTICLE INSPECTION CHECKLIST

|        | Inspection Sheet<br>Drawing Dimension | Tolerance     | Actual<br>Dimension | Accept | Reject | Method of<br>Inspection | Comments |
|--------|---------------------------------------|---------------|---------------------|--------|--------|-------------------------|----------|
| SIDE A | 2.240                                 | +/-0.005      | 2.244               | ✓      |        | BLM 3" 04"              |          |
|        | 2.180                                 | +0.005/-0.000 | 2.183               | ✓      |        |                         |          |
|        | 2.180                                 | +0.005/-0.000 | 2.184               | ✓      |        |                         |          |
|        | 2.237                                 | +0.005/-0.000 | 2.241               | ✓      |        |                         |          |
|        | 2.272                                 | +0.005/-0.000 | 2.276               | ✓      |        |                         |          |
|        | 2.306                                 | +0.005/-0.000 | 2.310               | ✓      |        |                         |          |
|        | 2.339                                 | +0.007/-0.000 | 2.346               | ✓      |        | VERNO8                  |          |
|        | 2.339                                 | +0.007/-0.000 | 2.345               | ✓      |        | "                       |          |
|        |                                       |               |                     |        |        |                         |          |
|        | 0.062                                 | +/-0.010      | .0625               | ✓      |        | RG                      |          |
|        | 5.25                                  | +/-0.060      | 5.270               | ✓      |        | VERNO8                  |          |
|        | R0.063                                | +/-0.010      | .063                | ✓      |        | RG                      |          |
|        | R0.50                                 | +/-0.030      | .5                  | ✓      |        | RG                      |          |
|        |                                       |               |                     |        |        |                         |          |
| SIDE B | 2.240                                 | +/-0.005      | 2.245               | ✓      |        | BLM 3" 04"              |          |
|        | 2.180                                 | +0.005/-0.000 | 2.184               | ✓      |        |                         |          |
|        | 2.180                                 | +0.005/-0.000 | 2.185               | ✓      |        |                         |          |
|        | 2.237                                 | +0.005/-0.000 | 2.240               | ✓      |        |                         |          |
|        | 2.272                                 | +0.005/-0.000 | 2.277               | ✓      |        |                         |          |
|        | 2.306                                 | +0.005/-0.000 | 2.311               | ✓      |        |                         |          |
|        | 2.339                                 | +0.007/-0.000 | 2.3455              | ✓      |        | VERNO8                  |          |
|        | 2.339                                 | +0.007/-0.000 | 2.345               | ✓      |        | "                       |          |
|        |                                       |               |                     |        |        |                         |          |
|        | 0.062                                 | +/-0.010      | .0625               | ✓      |        | RG                      |          |
|        | 5.25                                  | +/-0.060      | 5.280               | ✓      |        | VERNO8                  |          |
|        | R0.063                                | +/-0.010      | .063                | ✓      |        | RG                      |          |
|        | R0.50                                 | +/-0.030      | .5                  | ✓      |        | RG                      |          |
|        |                                       |               |                     |        |        |                         |          |
|        | 112.27                                | +/-0.060      | 112.27              | ✓      |        | TAPE                    |          |

|                                                             |  |                     |              |
|-------------------------------------------------------------|--|---------------------|--------------|
| <b>DART AEROSPACE LTD</b>                                   |  | <b>Work Order:</b>  | 174688       |
| <b>Description:</b> Crosstube Assembly (AS350/355 High Fwd) |  | <b>Part Number:</b> | D350-748-141 |
| <b>Inspection Dwg:</b> D350-748-141 Rev: H                  |  | <b>Page 2 of 2</b>  |              |

### WALL THICKNESS MEASUREMENT



| Location               | WALL THICKNESS MEASUREMENT (IN) |      |      |      | Deviation<br>$\Delta w$<br>(max-min) | TOLERANCE |
|------------------------|---------------------------------|------|------|------|--------------------------------------|-----------|
|                        | w1                              | w2   | w3   | w4   |                                      |           |
| READING 1<br>L= 0"     | .123                            | .124 | .129 | .125 | .006                                 | 0.030"    |
| READING 2<br>L= 18.71  | .131                            | .131 | .131 | .121 | .010                                 |           |
| READING 3<br>L= 37.42  | .169                            | .163 | .164 | .170 | .007                                 |           |
| READING 4<br>L= 56.14  | .160                            | .171 | .173 | .160 | .013                                 |           |
| READING 5<br>L= 74.85  | .169                            | .164 | .163 | .169 | .006                                 |           |
| READING 6<br>L= 93.56  | .123                            | .127 | .124 | .124 | .004                                 |           |
| READING 7<br>L= 112.27 | .132                            | .120 | .114 | .123 | .008                                 |           |

#### Calibration Result

Actual Block Thickness: 100-200

Sitescan 250 Measured Thickness: 100-200

|                                                     |                                                 |                                              |
|-----------------------------------------------------|-------------------------------------------------|----------------------------------------------|
| <b>Measured by:</b> M.D.<br><b>Date:</b> 2018-05-07 | <b>Audited by:</b> JTW<br><b>Date:</b> 18-05-25 | <b>Preliminary Approval:</b><br><b>Date:</b> |
|-----------------------------------------------------|-------------------------------------------------|----------------------------------------------|

| Rev | Date     | Change                                                    | Revised by | Approved |
|-----|----------|-----------------------------------------------------------|------------|----------|
| D   | 11.07.26 | Tolerance revised for 2.339 dimensions (P/O D350-748-101) | KJ         |          |
| E   | 12.06.04 | Wall thickness form added                                 | KJ         |          |
| F   | 13.05.08 | Dimension 112.27 was 110.27                               | KJ         |          |
| G   | 14.04.25 | 5.25 dimension revised to 5.25                            | KJ         |          |
| H   | 15.04.14 | Dwg Rev updated                                           | KJ         |          |
| I   | 15.09.09 | Tolerance updated for dimension 2.240                     | KJ         |          |



| Item | Qty  | Part Number     | Description                                                    |
|------|------|-----------------|----------------------------------------------------------------|
|      | -141 |                 |                                                                |
| 1    | X    | D350-748-141    | CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)                         |
| 2    | 1    | D6015-125       | CROSSTUBE (OR D6017-115)                                       |
| 3    | 2    | D3502-1         | SUPPORT                                                        |
| 4    | 2    | D5123-7         | CLAMP CUSHION                                                  |
| 5    | 1    | AELS-1032-225   | INSERT                                                         |
| 6    | 1    | NAS1149D0363J   | WASHER (OR AN960JD10)                                          |
| 7    | 2    | MS21920-20      | CLAMP (OR MS21920-21/-22, PER DART SPEC. M-MS21920-20/-21/-22) |
| 8    | 1    | MS27039-1-10    | SCREW                                                          |
| 9    | A/R  | PROSEAL 890 B-2 | SEALANT, AMS-S-8802 CLASS B-2                                  |

#### GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115  
FINISHED LENGTH AFTER TURNING = 112.270±0.06 (AFTER BENDING/TRIMMING = 110.27 REF)
- FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.  
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2  
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF  
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 30.45 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

#### TURNING

- BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS2759/1E AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.

#### BENDING

- ALL DIMENSIONS FOR BENT TUBE ARE POST STRESS RELIEF
- BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
- MAX AMPLITUDE OF RIBBLING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- AFTER BENDING, STRESS RELIEVE TUBE AT 650°F ±0.25°F FOR A MINIMUM OF 2 HRS AND ALLOW TO COOL TO AMBIENT TEMPERATURE (REF AMS2759/1E).
- MAX TWIST AFTER STRESS RELIEF: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

#### ASSEMBLY

- TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- TORQUE CLAMPS 80 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 174688M5  
1803-21

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2015 MAR 18

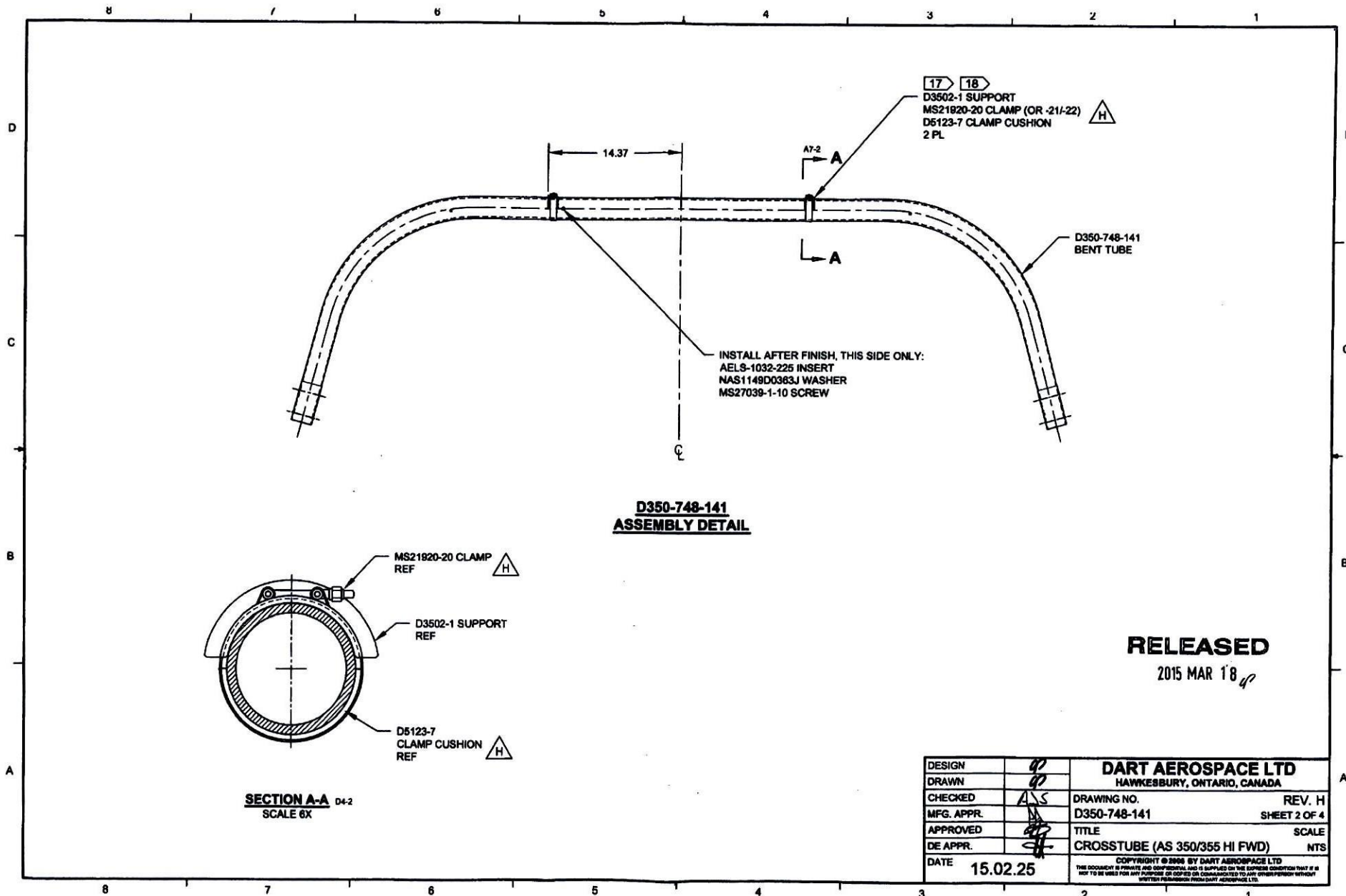
9 EN 15-597

|            |                                                                                                                                         |    |          |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------|----|----------|
| H          | D5123-7 WAS D3596-083-395, MS21920-20 WAS -22, ALLOWABLE CRUSHING NOW 8% WAS 7%                                                         | CP | 15.02.25 |
| G          | RMV ABRASION STRIP, SUPPORT NOW W/ PROSEAL & CUSHION, ADD STRESS RELIEF, LONGER CUFF, NOW TRIMD AFTER BEND, ADD WALL DIMS & UPDATE TOL. | CP | 12.09.12 |
| F          | ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)     | CP | 10.11.23 |
| E          | REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-048 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)           | RF | 09.09.30 |
| D          | MAG. PARTICLE AND CAD PLATE AS MFD.                                                                                                     | CP | 08.10.31 |
| C          | ADD CAD PLATING                                                                                                                         | CP | 08.08.14 |
| B          | ADD D6017-115 & PRIME AND PAINT                                                                                                         | CP | 08.06.30 |
| A          | NEW ISSUE                                                                                                                               | CP | 08.03.31 |
| REV.       | DESCRIPTION                                                                                                                             | BY | DATE     |
| DESIGN     |                                                                                                                                         |    |          |
| DRAWN      |                                                                                                                                         |    |          |
| CHECKED    | AS                                                                                                                                      |    |          |
| MFG. APPR. |                                                                                                                                         |    |          |
| APPROVED   |                                                                                                                                         |    |          |
| DE APPR.   |                                                                                                                                         |    |          |
| DATE       | 15.02.25                                                                                                                                |    |          |

DART AEROSPACE LTD  
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. H  
D350-748-141 SHEET 1 OF 4  
TITLE SCALE  
CROSSTUBE (AS 350/355 HI FWD) NTS

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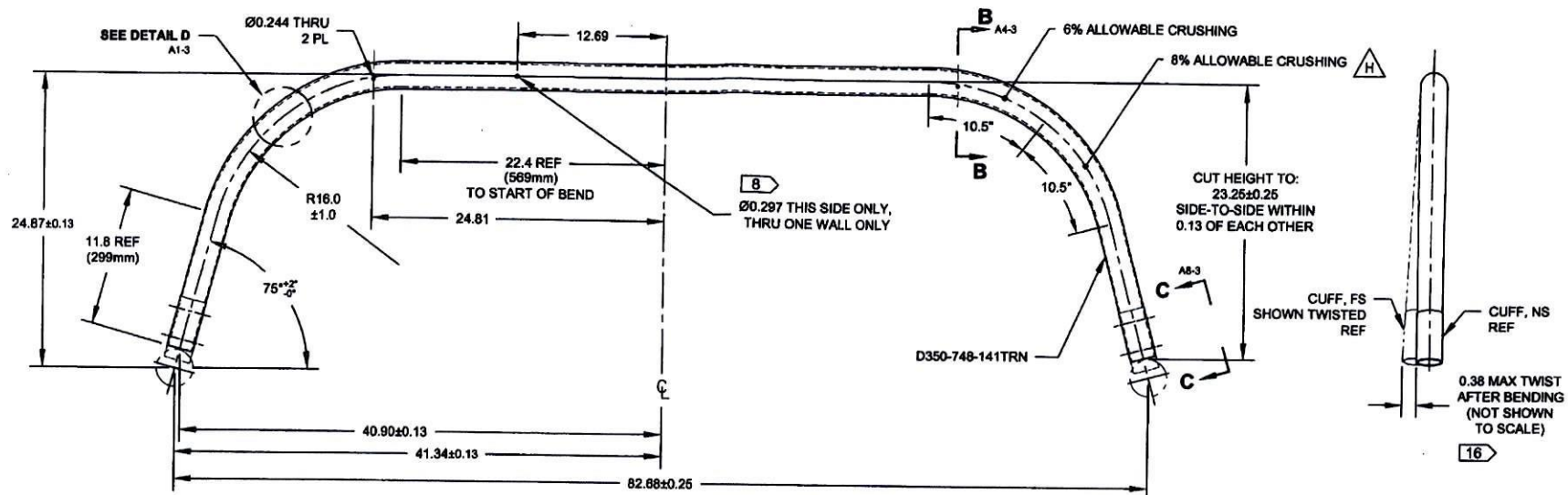


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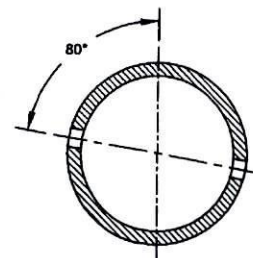
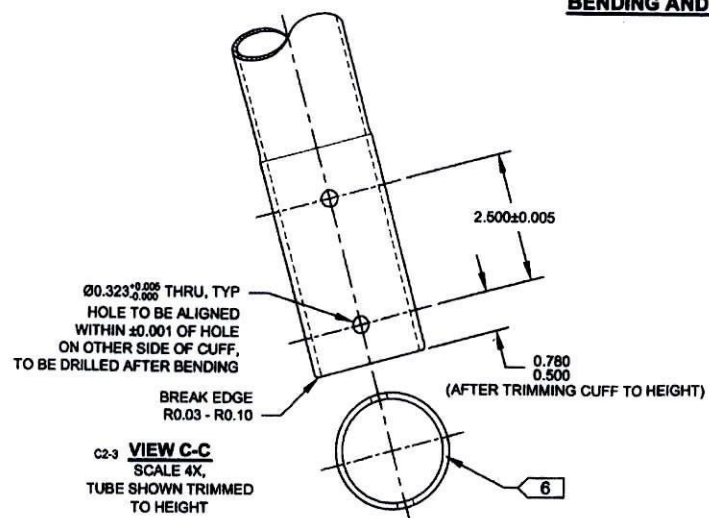
2015 MAR 18

|            |          |                                                                                                                                                                                                                                                                          |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | 90       | DART AEROSPACE LTD                                                                                                                                                                                                                                                       |              |
| DRAWN      | 90       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                              |              |
| CHECKED    | AS       | DRAWING NO.                                                                                                                                                                                                                                                              | REV. H       |
| MFG. APPR. | NA       | D350-748-141                                                                                                                                                                                                                                                             | SHEET 2 OF 4 |
| APPROVED   | 90       | TITLE                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | 90       | CROSSTUBE (AS 350/355 HI FWD)                                                                                                                                                                                                                                            | NTS          |
| DATE       | 15.02.25 | COPYRIGHT © 2008 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |





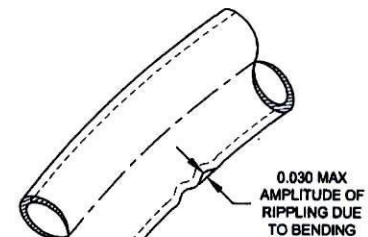
**D350-748-141**  
**BENDING AND DRILLING DETAIL 13**



**SECTION B-B** D3-3  
SCALE 8X

**RELEASED**

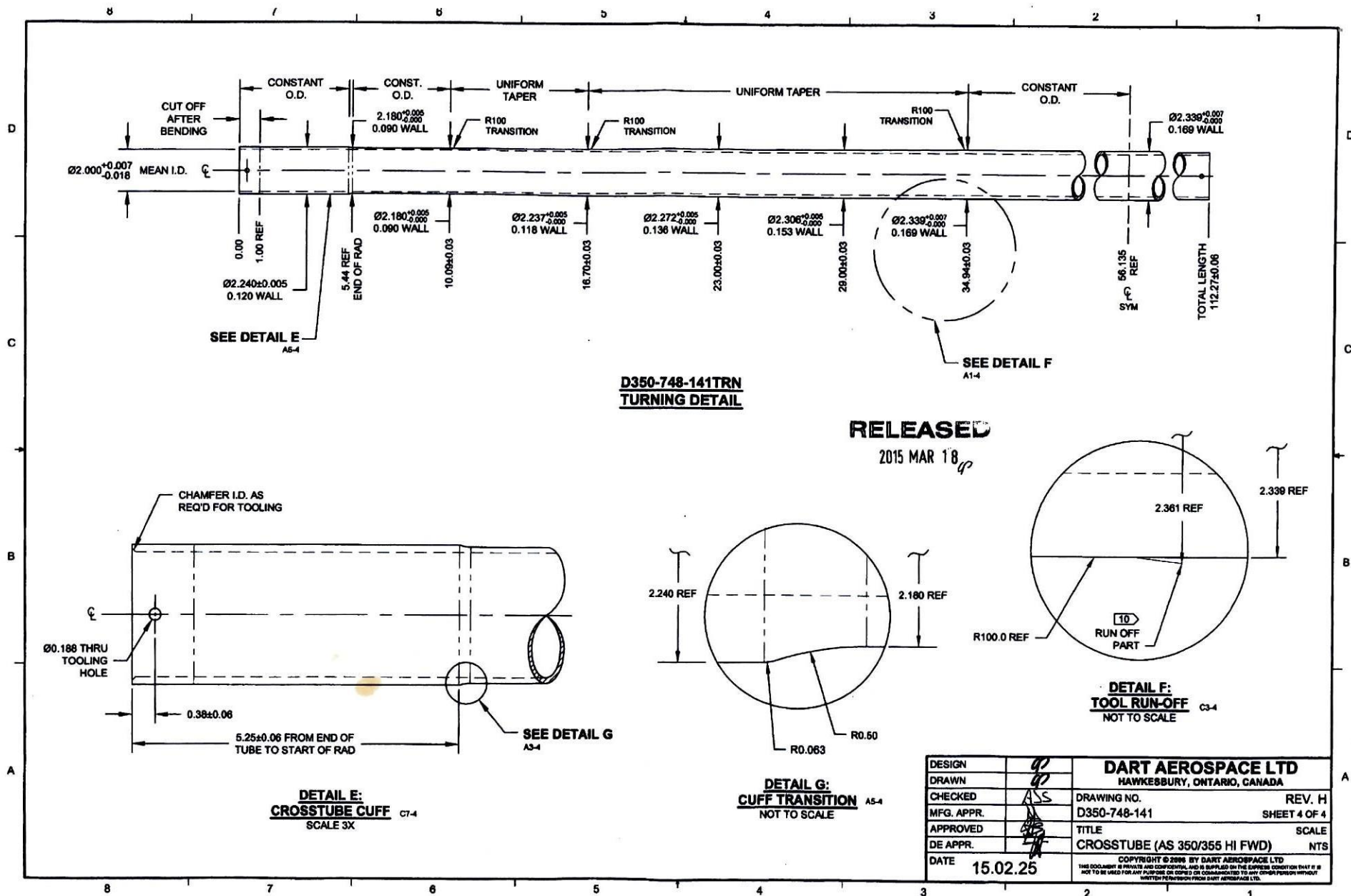
2015 MAR 18



**DETAIL D** D7-3  
SCALE 4X  
RIPPING EXAGGERATED

|            |    |                                                          |              |
|------------|----|----------------------------------------------------------|--------------|
| DESIGN     |    | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA |              |
| DRAWN      |    | DRAWING NO.                                              | REV. H       |
| CHECKED    | AS | D350-748-141                                             | SHEET 3 OF 4 |
| MFG. APPR. |    | TITLE                                                    | SCALE        |
| APPROVED   |    | CROSSTUBE (AS 350/355 HI FWD)                            | NTS          |
| DE APPR.   |    | DATE                                                     | 15.02.25     |

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Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

## PURCHASE ORDER PO040105

**Supplier:** MET002-VU  
Metlab  
1000 E. Mermaid Lane  
Wyndmoor, PA 19038 USA  
Phone: 215-233-2600  
Fax: 215-233-5653

**PO No:** PO040105  
**PO Date:** 6/5/18  
**Due Date:** 6/20/18  
**Purchase Order  
Revision:**  
**Revision Date:**  
**Ship-To Contact:** Phone:

**Ship To:** 1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

**Via:** Ground  
**Pymt Terms:** Net 30  
**Freight Terms:**  
**Special Comments:**

### Items

| Line Item         | Job    | Part            | Description                                                                                                                                                                                                                                                                                                                                   | Status | Due Date | Order Quantity | Received Quantity | Balance   | Unit Price (USD) | Extended Price    |
|-------------------|--------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|----------------|-------------------|-----------|------------------|-------------------|
| 1                 | 174757 | D350-748-241TRN | Crosstube Turning Detail<br>Issue P/O: _____<br>Heat Treat to min 180 KSI As per Dwg D350-748-241<br><br>***Check for straighten and ensure parts are straight within 1/8" as per dwg ***<br><br>Sand Blast tube after Heat Treat<br>Possible Supplier: Vac Aero<br>Ensure Certificate of Conformity is attached and Metlab process spec form | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174761 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174756 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174751 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174754 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174752 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174763 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174750 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174759 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174764 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174765 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174762 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174758 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174755 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
|                   | 174760 |                 |                                                                                                                                                                                                                                                                                                                                               | Firmed | 6/20/18  | 1 pcs          | 0 pcs             | 1 pcs     | \$205.00/pcs     | \$205.00          |
| <b>Sub Total:</b> |        |                 |                                                                                                                                                                                                                                                                                                                                               |        |          | <b>15</b>      | <b>0</b>          | <b>15</b> |                  | <b>\$3,075.00</b> |

## PURCHASE ORDER

| Items      |        |                 |                                                                                                                                                                                                                                                                                                                                                                              |        |          |                |                   |         |                  |                |
|------------|--------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|----------------|-------------------|---------|------------------|----------------|
| Item       | Job    | Part            | Description                                                                                                                                                                                                                                                                                                                                                                  | Status | Due Date | Order Quantity | Received Quantity | Balance | Unit Price (USD) | Extended Price |
| 2          | 174692 | D350-748-141TRN | Crosstube Turning Detail<br>Issue P/O: _____<br>Heat Treat to min 180 KSI As per Dwg D350-748-141<br>(MIL-T-6736 OR AMS 2759-1C)<br><br>***Check for straighten and ensure parts are straight within 1/8" as per dwg ***<br><br>Sand Blast tube after Heat Treat<br>Possible Supplier: Vac Aero<br>Ensure Certificate of Conformity is attached and Metlab process spec form | Firmed | 6/20/18  | 1 pcs          | 0 pcs<br>1X       | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174694 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174697 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174693 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174695 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174687 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174698 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174689 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174696 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174690 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174699 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 177660 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174686 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174700 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
|            | 174688 |                 |                                                                                                                                                                                                                                                                                                                                                                              | Firmed | 6/20/18  | 1 pcs          | 1X 0 pcs          | 1 pcs   | \$205.00/pcs     | \$205.00       |
| Sub Total: |        |                 |                                                                                                                                                                                                                                                                                                                                                                              |        |          | 15             | 0                 | 15      |                  | \$3,075.00     |

Grand Total: \$6,150.00

## Order Notes

C and At 18/5/18 CT.

## Procurement Quality Clauses

A005 right of entry  
A012 chemical and physical test report  
A016 personnel qualification  
A017 raw material identification (as applicable)

A022 Apical Processing  
A024 process certifications  
A026 certification of material conformance

A041 quality management system  
A042 dart notification by supplier  
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

Plex 6/5/18 10:31 AM dart.tsimiklis.chrisoula





1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093  
Tel. (215) 233-2600 Fax (215) 233-5653

## Certification - R

### SOLD TO

Dart Aerospace  
1270 Aberdeen St.  
Hawkesbury, ON K6A 1K7  
Canada

July 11, 2018

---

|                           |                                                                                                                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Metlab Shop Order:</b> | 100948                                                                                                                                                                            |
| <b>Purchase Order:</b>    | PO040105                                                                                                                                                                          |
| <b>Description:</b>       | Crosstube                                                                                                                                                                         |
| <b>Part Number:</b>       | D350-748-241TRN (15 Each)<br>D350-748-141TRN (15 Each)                                                                                                                            |
| <b>Weight:</b>            | 1310 Pounds Total                                                                                                                                                                 |
| <b>Material:</b>          | 4130 Alloy Steel                                                                                                                                                                  |
| <b>Specifications:</b>    | Harden and temper to 180 KSI minimum ultimate tensile strength (40 HRC surface hardness) per MIL-T-6736 or AMS 2759-1C. Maintain part straightness < 1/8" over total part length. |

---

This is to certify that the above parts were processed as indicated above and conform to the specification requirements.

### Results:

Hardness: 41/42 HRC

METLAB   
Quality Representative Matthew Robinson

MERCURY CONTAMINATION: During the heat treating process, testing and inspections, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing device.



Heat Treating and Metallurgical Consulting

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

Voice: 215-233-2600  
Fax: 215-233-5653

## Packing List

Sales Order Number:

100948

Sales Order Date:

Jun 7, 2018

Page:

1

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7  
CANADA

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7  
CANADA

| Customer ID | PO Number     | Payment Terms |
|-------------|---------------|---------------|
| DARA        | PO040105      | Net 30 Days   |
|             | Ship Via      | Process       |
|             | CALL CUSTOMER | HT            |

| Quantity | Item  | Description                                                                                                                                                                                                                                    | Total Shipped | This Shipment |
|----------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| 30.00    |       | 30 PCS<br>PART#: D350-748-241TRN<br>CROSSTUBES<br>HEAT TREAT TO MIN 180 KSI AS PER DWG<br>D350-748-241<br>CHECK FOR STRAIGHTEN AND ENSURE PARTS<br>ARE STRAIGHT WITHIN 1/8" AS<br>PER DWG. SAND BLAST TUBE AFTER HEAT<br>TREAT.<br>1310 POUNDS |               |               |
| 1.00     | CERT. |                                                                                                                                                                                                                                                |               |               |

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE